

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) Antenna arrangement ~~having the following~~
~~features comprising:~~
 - at least two antenna element systems ~~(3.1, 3.2) are provided and each have~~
having at least one antenna element (13; 13.1, 13.2), which are said elements being
arranged to be offset with respect to one another, at least in the horizontal direction,
 - the at least two antenna element systems ~~(3.1, 3.2) transmitting and receive~~
receiving at least in one common polarization plane,
 - a network ~~(17) is provided, via which the at least two antenna element~~
~~systems (3.1, 3.2) can be supplied with a signal~~signals (A_{in1} , A_{in2}) with an intensity or
amplitude which can be set differently or which can be adjusted relative to one another
and preferably with a different phase angle,

~~characterized by the following further features:~~
 - the network ~~(17) has~~having a phase shifter or phase-adjusting device
connected to receive (21, 121), via which an input signal (P_{sin}), said input signal being
~~which is supplied can be split into two output signals (PS_{out1} , PS_{out2}) with the same~~
intensity-intensities as one another but with a different phase angle~~angle to one another,~~
and in that, furthermore, and

a hybrid circuit (~~19, 119~~) is also provided, via which the output signals (PS_{out1} , PS_{out2}) can be converted to hybrid output signals (H_{out1} , H_{out2}) which are at a relatively fixed predetermined phase angle-angles with respect to one another and whose amplitudes differ from one another as a function of the different phase angles in the phase adjusting device (~~21, 121~~).

2. (Currently amended) Antenna arrangement ~~having the following~~
featurescomprising:

- at least two antenna element systems (~~3.1, 3.2~~) are provided and each has being at least one antenna element (~~13; 13.1, 13.2~~), which are arranged offset with respect to one another, at least in the horizontal direction,

- the at least two antenna element systems (~~3.1, 3.2~~) transmitting and receive receiving at least in one common polarization plane,

- a network (~~17~~) is provided, via which the at least two antenna element systems (~~3.1, 3.2~~) can be supplied with a signal (A_{in1} , A_{in2}) with an intensity or amplitude which can be set differently or which can be adjusted relative to one another and preferably with a different phase angle,

characterized by the following further featuresfurther including:

- the at least one network (~~17~~) is ~~designed~~being arranged such that a different beam shape is ~~produced~~used for receiving signals ~~than for~~as compared to transmitting signals.

3. (Currently amended) Antenna arrangement according to Claim 1 ~~or 2~~,
~~characterized in that~~wherein the hybrid output signals (H_{out1} , H_{out2}) have the same phase
~~angle or are phase shifted through 180°.~~

4. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to~~
~~3~~claim 1, ~~characterized in that~~further comprising an additional phase adjusting element
(31), which varies the phase angle, is provided between at least one output (19'a) of the
hybrid circuit (19) and at least one input (1) of the antenna system (3).

5. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to~~
~~4~~claim 1, ~~characterized in that~~wherein the phase adjusting element (21) comprises a
differential phase shifter (21').

6. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to~~
~~5~~claim 1, ~~characterized in that~~wherein the at least two antenna systems (3.1, 3.2) have
antenna elements (13.1, 13.2) which are arranged with a horizontal lateral offset with
respect to one another.

7. (Currently amended) Antenna arrangement according to Claim 6, ~~characterized~~
~~in that~~further comprising at least two antenna columns (5.1, 5.2) ~~are provided, with the~~
antenna elements (13.1) of one antenna system (3.1) ~~being provided in one column, and~~
the antenna elements (13.2) of the further antenna system (3.2) ~~being provided in the~~
other column (5.2).

8. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 7~~claim 1, ~~characterized in that~~wherein the hybrid circuit (19) is formed from a 90° hybrid (19').

9. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 7~~claim 1, ~~characterized in that~~further comprising at least four hybrid circuits (19) are ~~provided and are~~ combined to form a Butler matrix (119), via which a four-column antenna array can be fed, in which an input signal (PS_{in}) which can be supplied to the input of the phase shifter adjusting device (21) ~~can be~~is split into two phase output signals (PS_{out1} , PS_{out2}) and in that each output (21', 21'') of the phase adjusting device (21) is connected to two inputs (A, B, C, D) of the Butler matrix (119) via a respective downstream branching or addition point (~~35', 35''~~).

10. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 8~~claim 1, ~~characterized in that~~further comprising at least four hybrid circuits (19) are ~~provided and are~~ combined to form a Butler matrix (119), via which a four-column antenna array ~~can be~~is fed, with a double or multiple phase shifter arrangement being provided, such that the input signal (PS_{in}) which can be supplied to the input (23) of the network (17) and hence to the phase shifter adjusting device (121) can be divided into four phase shifter output signals, which can be supplied to the four inputs (A, B, C, D) of the Butler matrix (119).

11. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 10~~claim 1, ~~characterized in that~~wherein the antenna elements (3.1) which are arranged in

one column (5) are adjusted such that their main lobes are aligned parallel to one another, and in that antenna elements (3.1) which are provided and ~~may be~~ are offset with respect to one another in the horizontal direction are adjusted such that their main lobes are arranged such that they run parallel or run such that they are not parallel.

12. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 11~~ claim 1, characterized in that wherein the antenna elements (3.1, 3.2) are preferably also arranged in front of a common reflector arrangement (4).

13. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 12~~ claim 1, characterized in that wherein the antenna arrangement has antenna elements (3.1, 3.2) which transmit and receive in one polarization.

14. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 12~~ claim 1, characterized in that wherein at least two or more antenna elements (3.1, 3.2) are provided and transmit and receive partially in one polarization and partially in a second polarization plane, which is at right angles to the first polarization.

15. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 14~~ claim 1, characterized in that wherein the dual-polarized antenna elements are aligned at +45° and -45° to the horizontal.

16. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 15~~ claim 1, characterized in that wherein antenna elements (3.1, 3.2) are provided which transmit and receive in only one frequency band.

17. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 15~~claim 1, ~~characterized in that~~wherein two or more antenna elements (3.1, 3.2) are provided which transmit and receive in at least two frequency bands, preferably in at least two polarization planes.

18. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 17~~claim 1, ~~characterized in that~~wherein the connecting lines between the outputs (I, II, III, IV) of the hybrid circuit (119) and the inputs (13.1, 13.2, 13.3, 13.4) of the antenna arrangement can be interchanged ~~in order to~~ produce different horizontal polar diagrams.

19. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 18~~claim 1, ~~characterized in that~~wherein the connecting line between the outputs (I, II, III, IV) of the network (119) is ~~preferably~~ in the form of a hybrid circuit and at least some of the inputs (13.1, 13.2, 13.3, 13.4) of the antenna arrangement are of different lengths.

20. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 19~~claim 1, ~~characterized in that~~wherein the network (17) has a receiving path and a transmitting path with at least one receiving network (43) and one transmitting network (45), via which different horizontal polar diagrams ~~can be~~are produced for transmitting and receiving.

21. (Currently amended) Antenna arrangement according to Claim 20, ~~characterized in that~~wherein a receiving amplifier (48) and a transmitting amplifier (46), respectively, are provided in the receiving path and/or in the transmitting path.

22. (Currently amended) Antenna arrangement according to ~~one of Claims 1 to 21~~claim 1, characterized in that wherein the beam shape ~~can be~~is adjusted variably.

23. (Currently amended) Method for operating an antenna arrangement in particular according to ~~one of Claims 1 to 22~~, characterized by the following features comprising:

- varying an input signal ~~can be varied~~ via a phase adjusting device or a phase shifter adjusting device (~~21, 121~~) and a downstream network (~~17~~) such that the signal at the output of the network (~~17~~) and thus at the at least two inputs (~~3.1, 3.2~~) is in phase or is not in phase, preferably with a 180° phase shift, ~~such that this makes it possible to produce~~ to provide a horizontal radiation pattern corresponding to a horizontal polar diagram, specifically which is at least one of:

- (a) ~~which are~~ asymmetric, and/or
- (b) ~~which are~~ symmetrical and ~~have~~has at least two main lobes which are preferably symmetrical with respect to a vertical plane at right angles to the reflector plane, and/or

- (c) ~~which have~~has at least three main lobes or an odd number of main lobes, whose maximum intensities differ from one another by less than 50%.

24. (Currently amended) Method for operating an antenna arrangement in particular according to ~~one of Claims 1 to 23~~claim 23, ~~characterized by the following features~~ wherein:

- an antenna arrangement is used which has at least two antenna element systems (3.1, 3.2), which each have at least one antenna element (13.1, 13.2),
- the at least two antenna element systems (3.1, 3.2) transmit and receive in at least one common polarization plane, and
- producing a different beam shape or a different horizontal polar diagram ~~can be produced for receiving signals and for transmitting signals, by means of a network which is provided.~~

25. (Currently amended) Method according to Claim 24, ~~characterized in that~~including producing, during transmission, a horizontal polar diagram ~~is produced~~ which overlaps the horizontal polar diagram which is produced for reception, with the horizontal polar diagram ~~which is produced for transmission~~ having a surface area with a lower power density.

26. (Currently amended) Method according to ~~one of Claims 23 to 25~~claim 23, ~~characterized in that~~further comprising using a network (17) ~~is used which has a~~ receiving network (43) and a transmitting network (45), ~~via which~~for setting a horizontal polar diagram ~~can be set which is different for transmission and reception.~~

27. (Currently amended) Method according to ~~one of Claims 23 to 26~~claim 23, ~~characterized in that~~further including subjecting the signal which is supplied to the antenna ~~is subjected to an additional phase shift, at least upstream of one input (13.1 to 13.4).~~

28. (Currently amended) Method according to ~~one of Claims 23 to 27~~ claim 23, ~~characterized in that~~ further including using at least four hybrid circuits (19) ~~are used~~, via which a four-column antenna array is fed.

29. (Currently amended) Method according to Claim 28, ~~characterized in that~~ further including tapping off two phase shifter output signals (PS_{out1} , PS_{out2}) ~~are in each case tapped off at the two outputs of a phase shifter adjusting device (21), and in that the~~ supplying four resulting signals ~~which are produced in this way are supplied to the four inputs (A, B, C, D) of a Butler matrix (119).~~

30. (Currently amended) Method according to ~~one of Claims 23 to 28~~ claim 23, ~~characterized in that~~ further including using a double phase shifter arrangement (121) ~~is used, at whose four outputs four output signals can be~~ are produced which are supplied to the four inputs (A, B, C, D) of a Butler matrix (119).

31. (New) Antenna arrangement according to Claim 1, wherein the hybrid output signals are phase-shifted through 180°.